

**INTERAGENCY ACQUISITION AGREEMENT
NATIONAL PARK SERVICE
SIERRA NEVADA NETWORK
and
U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION**

ARTICLE I BACKGROUND AND OBJECTIVES

The NPS Sierra Nevada Network (Devils Postpile National Monument, Sequoia & Kings Canyon National Parks and Yosemite National Park), or SIEN, and the USDI U.S. Geological Survey Water Resources Division (USGS-WRD) will cooperate in the acquisition, management and synthesis of water resources data associated with waters of SIEN parks. The project will support the SIEN's planning process for a long-term water resources monitoring program by: 1) providing baseline water quality and discharge data for Devils Postpile National Monument and two watershed in Kings Canyon National Park where little previous work has been done; 2) acquiring existing water chemistry and discharge data from disparate sources for all network parks and synthesizing these data in a standard database format; and 3) creating a geodatabase with NPS GIS layers that will facilitate spatial analyses of water chemistry data.

The USGS-WRD has considerable experience in the collection, management, and interpretation of water quality data throughout the western United States. The USGS-WRD will work with the SIEN to acquire and synthesize the data needed to assist in the selection of sites and parameters for water resources monitoring. The statement of work below outlines the roles and responsibilities for NPS and USGS participants. An attached project description (Attachment 2) provides more background, project objectives, approach and implementation details, timeline and budget.

ARTICLE II LEGISLATIVE AUTHORITY

The legislative authority for using an interagency acquisition agreement is the *Economy Act* 31 U.S.C. § 1535 (a), which authorizes federal agencies to enter into agreements with each other for goods and services. See Determination and Findings (Attachment 1) for justification as to why this agreement is in the best interest of the government and meets the specifications of the Economy Act.

ARTICLE III STATEMENT OF WORK

A. The USGS agrees to:

1. Retrieve and preprocess data from the California District NWIS database and STORET. Preprocessing will involve checking NWIS and STORET records for completeness using preset criteria, specified by USGS and NPS. [FY2004]
2. Modify the water-quality MS Access database created for the Northern Colorado Plateau Network so that it can be used for the Sierra Nevada Network. [FY2004]
3. USGS will provide database documentation, a data dictionary, and documented protocols for periodic database updates. [FY2005]
4. Set up a simple geodatabase that will include readily available data layers with required metadata, identified by NPS (eg., park boundaries, stream network, lakes, vegetation, soils, geology). The purpose of the geodatabase will be to allow spatial analysis of the water-quality data. [FY2004]
5. Import additional water-quality datasets provided by NPS staff into MS Access database. [FY2005]
6. Create a separate table in the water-quality database for storing daily discharge records at fixed monitoring stations in each park. USGS will retrieve and upload data from USGS stations. [FY2005]
7. Provide a training session to SIEN staff in Denver on using and maintaining the water-quality database and the geodatabase. [FY2005]
8. Sample water chemistry and discharge for the Middle Fork of the San Joaquin River watershed in Devils Postpile National Monument (DEPO) water samples and along several stream transects in Kings Canyon National Park. [FY2004]
9. Incorporate these new data from DEPO and Kings Canyon NP into the SIEN water quality database. [FY2005]

B. The NPS agrees to:

1. Provide \$38,511 in payment for completion of FY2004 work outlined above and in Attachment 2 and upon delivery of specified products. [FY2004]
2. Provide lat-long polygons defining the boundaries of each park. Only water-quality samples that fall within the defined polygon will be included in the database. [FY2004]
3. Provide GIS layers with required metadata agreed upon for inclusion in the geodatabase . [FY2004]
4. Obtain and preprocess data sets from sources other than NWIS and STORET (for example NPS, USDA-Forest Service, State of California, Universities, etc.). NPS will be responsible for ensuring that records in these 'other' data sets have the minimum required information for upload into the water-quality database. NPS will provide these datasets to the USGS in MS Excel or MS Access file formats. [FY2004]
5. Provide daily discharge records for non-USGS stations. [FY2004]
6. Provide field sampling support for Devils Postpile National Monument and/or Sequoia and Kings Canyon baseline water quality data collection. [FY2004]
7. Provide timely review of the draft final products. [FY2004-2005]

ARTICLE IV PAYMENT

A. Funding

\$38,511 will be provided from the Sierra Nevada Network Inventory and Monitoring program budget 2130-1000-NWZ to fund work for FY2004. Continuation of work under this agreement for succeeding fiscal years shall be contingent upon the availability of funds. If available, additional funds will be added to the agreement in FY2005 to allow completion of the FY2005 tasks specified above. Nothing in this Agreement shall be construed as to obligating the Park Service or USGS to expend any funds in excess of those appropriated by law.

B. Transfer of Funds

The U.S. Geological Survey-Water Resources Division shall invoice the National Park Service, Sierra Nevada Network, Sequoia and Kings Canyon National Parks, using the Interagency Payment and Collection (IPAC) billing system.

Billings should contain a reference to Inter-Agency Agreement No. F2130040417.

The Agency Locator Code for NPS is 14-10-0099 and for USGS 14-08-0001.

ARTICLE V TERM OF AGREEMENT

Work shall commence upon execution of this agreement and continue until and according to schedules set forth in the Project Description (Attachment 2) and/or as agreed upon by the NPS and USGS-WRD project managers. A modification will be developed in FY2005 to add additional funds and complete tasks needed for final products. The modification to add additional funds is contingent upon receipt of sufficient funds in FY2005. Should funding not be available, the NPS agrees to engage in good faith negotiation to establish a modified list of deliverables.

ARTICLE VI MODIFICATION AND TERMINATION

Either party may terminate this Agreement by providing thirty (30) days advanced written notice to the other party. In the event that one party provides the other party with notice of its intention to terminate, the parties will meet promptly to discuss the reasons for the notice and to try and resolve any differences if necessary.

This agreement may be modified only by a written instrument executed by one of the Agencies.

ARTICLE VII KEY OFFICIALS AND APPROVALS

Key officials for this Interagency Agreement shall be:

Linda Mutch
Network Coordinator/COR
Sequoia & Kings Canyon NP
47050 Generals Hwy
Three Rivers, CA 93271
(559) 565-3174
linda_mutch@nps.gov

Fred Picavet
Contracting Officer
Sequoia & Kings Canyon NP
47050 Generals Hwy
Three Rivers, CA 93271
(559) 565-3180
fred_picavet@nps.gov

David Clow, Ph.D.
Research Hydrologist
USGS-WRD
MS 415, Bldg. 53
Denver Federal Center
Denver, CO 80225
303-236-4882 x294
dwclow@usgs.gov

Alisa Mast, Ph.D.
Research Hydrologist
USGS-WRD
MS 415, Bldg. 53
Denver Federal Center
Denver, CO 80225
303-236-4882 x314
mamast@usgs.gov

Eric Hensel
Administrative Officer
USGS-WRD
MS 415, Bldg. 53
Denver Federal Center
Denver, CO 80225
303-236-4882 x259
efhensel@usgs.gov

ARTICLE VIII AUTHORIZING SIGNATURES:

David M. Graber, Science Advisor,
Sequoia & Kings Canyon NP
Chair, Sierra Nevada Network Board of Directors

Date

Kathleen M. Spinetti, Contract Specialist
National Park Service, Pacific West Region

Date

Eric Hensel, Administrative Officer
USGS-WRD

Date

Determination and Findings

1. Explain why this Interagency Acquisition Agreement is in the best interest of the Government.

The project requires specific expertise possessed by the co-Principal Investigators: David Clow has extensive experience sampling water chemistry and hydrology in the Sierra Nevada, and he has developed a methodology to assess the sensitivity of water bodies to atmospheric deposition. His approach has been applied in other similar parks (including Yosemite) and nearby wilderness areas. Alisa Mast has worked with other I&M networks in the development of water quality MS Access databases and geodatabases—she can readily adapt these databases to meet the needs of the Sierra Nevada Network.

2. Explain why the supplies or services cannot be obtained as conveniently or economically by contracting with a private source.

Choosing another source would not take advantage of the personal knowledge and experience of the Principal Investigators, and most elements of the project could not be successfully completed within the time frame required. Even marginal project completion would require extensive literature reviews as well as many weeks of orientation to the parks of the Sierra Nevada. This would add significantly to the cost of the project and would delay the final products by as much as one year or more.

3. Explain the cost savings that the NPS will realize.

The work proposed to be performed through an Interagency Acquisition Agreement with the U.S. Geological Survey, Water Resources Division, will result in cost savings and efficiency because the requested database structure and QA/QC procedures have already been developed by USGS-WRD for other networks—this saves a tremendous amount of time in labor. The extensive work that PI David Clow has done in the Sierra Nevada gives him the familiarity with the parks and water resources that is needed to accomplish the sampling and analyses within the time frame needed for the network's planning process. Contracting with another investigator would require additional costs in time and funding to get oriented to the Sierra Nevada and to become familiar with methods and approach that the field data collection and analyses require.

4. If the servicing agency will contract for service or supplies, please check the following applicable statement(s):

- ☐ (a) The acquisition will appropriately be made under an existing contract of the servicing agency, entered into before placement of the order, to meet the requirements of the servicing agency for the same or similar supplies or services;
- ☐ (b) The servicing agency has capabilities or expertise to enter into a contract for such supplies or services which are not available within the requesting agency; or
- ☐ (c) The servicing agency is specifically authorized by law or regulation to purchase such supplies or services on behalf of other agencies.

Name: _____
Linda Mutch, Network Coordinator

Date

DETERMINATION AND FINDINGS

**Interagency Acquisition Agreement Number F2130040417
between
National Park Service
Sierra Nevada Network
and
U.S. Geological Survey
Water Resources Division**

FINDINGS

Based upon information provided by the NPS Sierra Nevada Network, in a justification dated April 14, 2004, I determine that:

1. Legal authority for the acquisition otherwise exists, and
2. The action does not conflict with any other agency's authority or responsibility.

DETERMINATION

In accordance with the *Federal Acquisition Regulation, Subpart 17.5*, I find that this Interagency Acquisition Agreement is appropriate.

Kathleen M. Spinetti
Contracting Officer

Date

PROJECT DESCRIPTION**BACKGROUND**

The Sierra Nevada Network (SIEN) parks are tasked with developing a monitoring program to assess park natural resources. The SIEN is one of 32 vital signs monitoring networks nationwide in the National Park Service (NPS). The network is comprised of the following NPS administered units in California: Devils Postpile National Monument (DEPO), Sequoia and Kings Canyon National Parks (SEKI) and Yosemite National Park (YOSE).

The NPS vital signs monitoring program planning framework is described by Fancy and Gross (2004). The NPS Water Resources Division provides funds for a water quality component of this program. The development of network monitoring programs is a complex process that requires a front-end investment in planning and design to ensure that monitoring will meet the most critical information needs of each park and produce scientifically credible data. The Washington Office of NPS has identified three phases of monitoring planning and plan development for vital signs monitoring networks and has provided a detailed outline of plan content (Fancy and Gross 2004). Phase I is concerned with synthesizing existing information on monitoring in the parks and by partners and neighboring land managers, identifying key management issues and developing conceptual models to support planning efforts. Phase II focuses on steps involved in selecting vital signs indicators and documenting the rationale and process.

This agreement is concerned with work needed to complete Phase I and II of the monitoring planning process, specifically the water resources and water quality portion of the plan. Phase III deals with monitoring design.

Goal: The work proposed under this interagency agreement is designed to acquire and synthesize existing water quality data for Sierra Nevada Network parks and to provide additional baseline data from undersampled watersheds that will assist the network in prioritizing sites for long-term monitoring.

Objectives:

1. Acquire water quality data for Sierra Nevada Network parks from disparate sources, pre-process data to ensure it meets established criteria and input data into MS Access database modified from the Northern Colorado Plateau Network.
2. Acquire daily discharge records for SIEN parks and input into Water-Quality database.
3. Create a geodatabase to interface with MS Access water quality (and discharge) database and to enable spatial analyses of water data using readily available GIS data layers for network parks.
4. Provide baseline water quality and discharge data for Devils Postpile National Monument.
5. Provide baseline water quality and discharge data for two undersampled watersheds in Kings Canyon National Parks.
6. Add new water quality and discharge baseline data for Devils Postpile National Monument and Kings Canyon National Park to Water-Quality database.

7. Provide database documentation, instructions and training to SIEN staff.

APPROACH AND IMPLEMENTATION

Data Acquisition and Database Development

Using an approach previously developed for the Northern Colorado Plateau Network (NCPN) by USGS-WRD staff, Principal Investigator Alisa Mast will work with SIEN staff to acquire water quality data, do necessary pre-processing and input data into the adapted NCPN database. Pre-processing will involve checking water quality records for completeness using preset criteria, specified by USGS and NPS. For example, each sample will be required at a minimum to have an associated latitude, longitude, sample type, sample date, and collection agency. Each water-quality result must be associated with a parameter code from the USGS parameter code dictionary. USGS will pre-process STORET and NWIS data while NPS staff will pre-process other datasets not included in STORET and NWIS. STORET data will be cross-checked with data in the Horizon reports to ensure the STORET data are complete. All 'other' data sets must be submitted to the USGS by a predetermined date; data obtained after that date will not be included in the initial database. NPS will provide a lat-long polygon defining the boundaries of each park. Only water-quality samples that fall within the defined polygon will be included in the database.

USGS will set up a simple geodatabase that will include readily available data layers and metadata, identified by NPS (eg., park boundaries, stream network, lakes, vegetation, soils, geology). The purpose of the geodatabase will be to allow spatial analysis of the water-quality data. USGS will provide a training session to SIEN staff in Denver on using and maintaining the water-quality database and the geodatabase.

In addition to the tables developed for the NCPN database, USGS will create a separate table in the SIEN water-quality database for storing daily discharge records at fixed monitoring stations in each park. USGS will retrieve and upload data from USGS stations, and NPS will provide daily discharge records for non-USGS stations.

USGS will provide a training session to SIEN staff in Denver on using and maintaining the water-quality database and the geodatabase. USGS will provide database documentation, a data dictionary, and documented protocols for periodic database updates.

Baseline Water Quality Data Collection in Undersampled Watersheds for Devils Postpile National Monument and Kings Canyon National Park

Principal Investigator David Clow has done extensive water chemistry and hydrologic sampling in the Sierra Nevada and other western parks. He has developed a methodology for assessing sensitivity of wilderness water bodies to atmospheric deposition of nitrogen and sulfur (Clow et al. 2003) and through another funding source, is currently doing a risk assessment of sensitivity of high elevation lakes in Yosemite to impacts of atmospheric deposition (Clow et al. in progress).

Water-quality data in Sequoia and Kings Canyon National Parks (SEKI) Wilderness Areas and in the Devils Postpile National Monument (DEPO) are sparse, except for a

few areas where abundant data have been collected through intensive, process-oriented studies in Sequoia National Park (eg., Emerald Lake, Log and Tharp Creeks). The only parks-wide studies of water-quality in SEKI Wilderness Areas were the 1985 Western Lake Survey, and a resampling of the same lakes in 1999. Twenty-two lakes were sampled during each of those surveys, accounting for 0.7% of the total number of lakes in the two parks. Water-quality data for DEPO is extremely limited.

To begin filling some of the gaps in baseline water-quality information, water samples and discharge data will be collected by the U.S. Geological Survey (USGS) along several stream transects in Kings Canyon National Park, and in DEPO during 2004. Focused data collection along the stream transects will permit evaluation of fine-scale variations in water chemistry, and will complement the lake survey data that has already been collected. It will also provide information that can be used to evaluate how stream chemistry varies as a function of basin characteristics, such as basin size, elevation, vegetation type and amount, and geology. This information will assist the SIEN in its prioritization and selection of sites for long-term water resources monitoring.

Details:

At Devils Postpile National Monument, the Middle Fork of the San Joaquin is the dominant hydrologic feature; samples will be collected where the Middle Fork enters and leaves the Monument and at the two main tributary streams that flow into the Middle Fork in the Monument. Sites in DEPO will be sampled twice, once during high flow (June) and once during low flow (September) to document seasonal changes in stream chemistry. Stream flow (discharge) will be measured by USGS at the time of sample collection, except where high flows make conditions for wading in the stream unsafe.

The stream transects to be sampled in Kings Canyon National Park include the Kings River east (upstream) of the Horseshoe Bend Overlook, and the South Fork of the San Joaquin River upstream from the park boundary. One dozen samples will be collected by USGS along each transect, with sites distributed at approximately equal distances apart. Chemistry and stream flow data from these sites will be supplemented with additional field measurements of stream temperature and conductance at two to three dozen additional sites in the basins in which the transects are performed. These additional measurements will provide increased fine-resolution data on the total dissolved solids content of water in the study basins.

Samples will be analyzed by USGS in their certified laboratory for pH, conductance, alkalinity, the following dissolved constituents: calcium, magnesium, sodium, potassium, ammonium, nitrate, sulfate, chloride, and organic carbon, and the following whole water constituents: nitrogen and phosphorus. Standard USGS analytical methods will be used, as described in Fishman et al (1993). QA/QC samples (ie., blanks, replicates) will comprise 5% of the total sample load. Water sampling will follow standard USGS protocols, as specified in Wilde et al. (1998).

Water chemistry and field measurement data will be uploaded into the new water-quality database being designed for the Sierra Nevada network of the NPS Inventory and Monitoring Program by USGS.

TIMELINE and PRODUCTS

FY2004:

1. Project initiation: June 1, 2004.
2. USGS establishes field sampling schedule, location and strategy with SIEN staff: June 15, 2004
3. NPS provides lat-longs for polygons defining the boundaries for each park area to be included in database: June 15, 2004.
4. USGS retrieves and preprocesses data from the California District NWIS database and STORET and modifies NCPN MS Access database for SIEN data: September 30, 2004.
5. NPS provides GIS layers and metadata for inclusion in geodatabase: July 15, 2004.
6. NPS provides all additional and available water quality datasets (preprocessed and NPS) to USGS for inclusion in database: September 30, 2004.
7. USGS provides progress report that briefly summarizes: 1) database development to date and datasets and GIS layers that will be included; and 2) the summer field sampling effort (description of sites and parameters sampled, outline of final report to be produced in FY2005): September 30, 2004.

FY2005: (If funds are made available)

1. Modify agreement to add additional \$21,947 in funds to complete geodatabase project: October 2004.
2. USGS retrieves discharge data from NWIS and NPS provides discharge data from other sources for inclusion in database: December 31, 2004.
3. Complete geodatabase with layers provided by NPS: December 31, 2004
4. Complete MS Access database with water quality and discharge datasets from NWIS, STORET and other sources that NPS staff provide: April 30, 2005
5. Provide database documentation, update instructions and training in use of the database to SIEN staff: April 2005.
6. Agreement end date: January 31, 2006.

BUDGET

USGS-WRD Budget

BUDGET AND FTEs:

	FY 2004	FY 2005
a. Personnel:		
Research Hydrologist; database work	\$ 3,393	\$ 13,572
Research Hydrologist; water quality work	\$ 10,788	\$ -
Physical Science Technicians	\$ 4,900	\$ 5,512
b. Materials		
supplies	\$ 1,114	\$ -
equipment	\$ 1,114	\$ -
c. Analytical Services		
\$ 250 /sample	\$ 6,960	\$ -
d. Transportation/travel	\$ 5,220	\$ -
e. Overhead (15%)	\$ 5,023	\$ 2,863
e. Total Project Cost, per year	\$ 38,511	\$ 21,947

NPS Contribution to Project

<u>Personnel</u>	FY2004	FY2005
Physical Scientist (database and field support)	\$7,500	\$3,000
<u>Travel</u>	\$500	\$1,200
(field support, in-network travel and database training)		
TOTAL	\$8,000	\$4,200

CITATIONS

- Clow, D.W., Sickman, J.O., Striegl, R.G., Krabbenhoft, D.P., Elliott, J.G., Dormblaser, M., Roth, D.A. and Campbell, D.H. 2003. Changes in the chemistry of lakes and precipitation in high-elevation national parks in the western United States, 1985-1999. *Water Resources Research*, **39**:1171, doi: 1110.1029/2002WR001533.
- Clow, D.W., Dettinger, M. and Cayan, D. in progress. Risk assessment for aquatic ecosystems in wilderness areas in Yosemite National Park.
- Fancy, S. and Gross, J. 2004. Monitoring natural resources in our national parks. <http://science.nature.nps.gov/im/monitor/index.htm>.
- Fishman, M.J. 1993. Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory -- Determination of inorganic and organic constituents in water and fluvial sediments. Open-File Report 93-125, U.S. Geological Survey, Denver.
- Wilde, F.D. D. B. Radtke, J. Gibs, and R. T. Iwatsubo, editors. 1998. National Field Manual for the Collection of Water-Quality Data. U.S. Geological Survey, Denver.